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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/681,618
Filing Date: October 08, 2003
Appellant(s): WILLIAMS ET AL.

Peter Kragulijac (#38,520)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 18 August 2010 appealing from the Office action mailed 26 January 2010.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application: Pending claims 1-12, 14-19, and 25-38. Claims 1-12, 14-19, and 25-38 are rejected.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

6,324,620	Christenson et al	11-2001
6,671,772	Cousins	12-2003
2002/0138670	Johnson	9-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims **1**-**5**, **8**-**12**, **25**-**27**, **29**-**34**, and **38** are rejected under 35 U.S.C. 102(b) as being anticipated by Christenson et al (U.S. 6,324,620), hereinafter referred to as Christenson.

As per independent claim **1**, Christenson teach, an access controller configured to control access requests to a storage device by metering access to data within a first predefined region (Column 6 lines 45-67: taught as the COLD REGION) within the storage device and by allowing unmetered access to data within a second predefined region within the storage device (Column 6 lines 45-67: taught as the HOT REGION). (see also Column 12 lines 18-32, lines 62-67 and Column 13 lines 1-8) *The Examiner notes that in referring back to Applicant's specification, paragraph 0025, 'cold access requests can be metered by, for example, ... giving priority to hot access requests…' The Examiner notes that Christenson teaches that, "requests for HOT data from high priority jobs are handled first. Next, requests for COLD for a high priority job is handled (Column 12 lines 23-25." As simply and broadly claimed, by handling the requests for the HOT data before the handling of requests for COLD data, Christenson teaches that which is instantly claimed.*

As per dependent claim **2**, Christenson teach, where the system is embedded in one of, a database system, an operating system, and an application configured to process access requests to the storage device (Column 5 line 65 to Column 6 line 41).

As per dependent claim **3**, Christenson teach, where the system further includes allocation logic configured to determine a priority for data to be written to the storage device and causing the data to be stored within the first region or the second region based on the priority (Column 8 line 62 to Column 9 line 5).

As per dependent claim **4**, Christenson teach, where the priority of the data includes a plurality of priority levels (Column 13 lines 13-14: taught as COLD data, HOT data, or neither).

As per dependent claim **5**, Christenson teach, where the storage device includes one or more disk drives (Column 3 lines 56-61: taught as a plurality of DASD units).

As per dependent claim **8**, Christenson teach, where the system is embedded in a file system configured to process data input and output requests to the storage device (Column 5 line 65 to Column 6 line 41).

As per dependent claim **9**, Christenson teach, where the access requests include at least one of data input and data output requests (Column 3 lines 36-38: taught as data access, i.e. output).

As per dependent claim **10**, Christenson teach, where the access controller is configured to meter access based on a threshold of access requests directed to the data within the first region (Column 3 lines 42-45 of Christenson: taught as restricting I/O requests to the "COLD" based on the low frequency threshold of accesses for the data in the portion. This is further taught in Column 10 lines 14-53 of Christenson. If the threshold of access for the data is exceeded, the system of Christenson moves the data to unmetered access, “HOT” as taught in Column 10 lines 56-67).

As per dependent claim **11**, Christenson teach, further including one or more tables configured to define at least the data in the first region to be metered (Column 17 lines 31-59: taught as the ASP table and utilization thereof).

As per dependent claim **12**, Christenson teach, where the data in the one or more tables is configured to define one or more of, a file, an application, and a data location (Column 17 lines 7-43: taught as the interfacing with the ASP table).

As per independent claim **25**, Christenson teach, processing access requests to a storage device; and controlling the access requests to the storage device by metering access to data within a first predefined region within the storage device (Column 6 lines 45-67: taught as the COLD REGION) and by allowing unmetered access to data within a second predefined region within the storage device (Column 6 lines 45-67: taught as the HOT REGION). (see also Column 12 lines 18-32, lines 62-67 and Column 13 lines 1-8) *The Examiner incorporates by reference herein and further notes that Christenson teach a computer readable medium as claimed at least as is shown in Claims 41 and 43.*

As per dependent claim **26**, Christenson teach, where the storage device includes a disk drive (Column 3 lines 56-61: taught as a plurality of DASD units).

As per dependent claim **27**, Christenson teach, further including processor executable instructions operable to cause a processor to store data to the storage device based on a priority of the data, the data being stored in one of the first region and the second region (Column 7 lines 13-43).

As per dependent claim **29**, Christenson teach, where the metering includes limiting a number of the access requests to the first region from being processed (Column 6 lines 45-67: taught as the COLD REGION and the higher priority given to the HOT REGION and thus access requests to the COLD REGION are limited).

As per dependent claim **30**, Christenson teach, where the processing includes determining to which region each of the access requests is directed (Column 12 lines 18-32).

As per dependent claim **31**, Christenson teach, further including processor executable instructions operable to cause a processor to define at least the first region and the second region within the storage device (Column 9 lines 24-54: taught as the partitioning of the DASD unit)

As per dependent claim **32**, Christenson teach, including means for allocating data to a selected region within the storage device (Column 11 lines 1-16).

As per dependent claim **33**, Christenson teach, where the computer-readable medium is integrated with at least one of: a data base system, a file system, an operating system, and the storage device (Column 5 line 65 to Column 6 line 41).

As per dependent claim **34**, Christenson teach, access controller means for metering access requests to the first region (Column 5 line 65 to Column 6 line 41:the means being taught as the system; and Column 6 lines 45-67: taught as the COLD REGION and the higher priority given to the HOT REGION and thus access requests to the COLD REGION are metered).

As per independent claim **38**, Christenson teach, receiving access requests to a storage device; and increasing response time for access requests to a first predefined region within the storage device by providing unmetered access to the first predefined region while metering access requests to a second predefined region within the storage device (see also Column 12 lines 18-32, lines 62-67 and Column 13 lines 1-8) *The*

Examiner notes that in referring back to Applicant's specification, paragraph 0025, 'cold access requests can be metered by, for example, ... giving priority to hot access requests…' The Examiner notes that Christenson teaches that, "requests for HOT data from high priority jobs are handled first. Next, requests for COLD for a high priority job is handled (Column 12 lines 23-25)." As simply and broadly claimed, by handling the requests for the HOT data before the handling of requests for COLD data, Christenson teaches that which is instantly claimed.

Claims **6**-**7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Christenson and in view of Cousins (U.S. 6,671,772), hereinafter referred to as Cousins.

As per dependent claim **6**, Christenson teach the limitations as noted supra.

Christenson does not explicitly teach, where the storage device includes a disk and where the second region is defined closer to a perimeter of the disk than the first region.

Cousins teaches, where the storage device includes a disk and where the second region is defined closer to a perimeter of the disk than the first region (Column 3 lines 24-27: taught as the placement of sectors on the outside of the disk).

Christenson and Cousins are analogous art because they are from the same field of endeavor namely, disk storage devices.

At the time of invention, it would have been obvious to one of even rudimentary ordinary skill in the art, having both the teachings of Christenson and Cousins before him/her to combine the placement of sectors on the outside tracks of the disks of Cousins with Christenson for the benefit of reduced seek times.

The suggestion for doing so would have been that, to help address minimizing seek times of the disk, over the past few years, disk densities have been improved by placing more sectors on tracks at the outside of a disk than at the inside of the disk (Column 3 lines 24-27).

The Examiner further notes that all of the component parts are known in Christenson and Cousins. The only difference is the combination of the old elements by implementing the placement of sectors on tracks at the outside of a disk to reduce seek times of Cousins into the device of Christenson. As the combination of Christenson and Cousins teaches each limitation as instantly claimed, and as such is known in the prior art, one skilled in the art could have combined the elements from Christenson and Cousins by known methods with no change in their respective functions, and the combinations thereof would have yielded predictable results to one of ordinary skill in that art thus obviating that which is instantly claimed.

Therefore, it would have been obvious to combine Christenson with Cousins for the benefit of reduced seek times to obtain the invention as specified in claims 6-7.

As per dependent claim **7**, the combination of Christenson and Cousins teach, where the first region and the second are defined by one or more logical block addresses (Column 13 lines 33-59 of Christenson: taught as the logical dasd and the 1:1 correlation between the logical dasd and the subsystem).

Claims **14**-**19**, **28**, and **35**-**37**are rejected under 35 U.S.C. 103(a) as being unpatentable over Christenson and in view of Johnson (U.S. 2002/0138670), hereinafter referred to as Johnson.

As per independent claim **14**, Christenson teach, receiving access requests to a storage device; and increasing response time for access requests to a first predefined region within the storage device (Column 6 lines 45-67: taught as the HOT REGION) by metering access requests to a second predefined region within the storage device; (Column 6 line 45-67: taught as the COLD REGION)

Christenson does not explicitly teach, where the metering includes limiting a number of access requests to the second region based on a threshold number of the access requests.

Johnson teach, where the metering includes limiting a number of access requests to the second region based on a threshold number of the access requests (Paragraphs 0020 and 0025).

Christenson and Johnson are analogous art because they are from the same field of endeavor, namely disk storage systems.

At the time of invention it would have been obvious to a person of ordinary skill in the art, having both the teachings of Christenson and Johnson before him/her, to combine the starvation counter of Johnson with Christenson to prevent starvation of the low priority requests.

The motivation for doing so would have been that, if the starvation counter reaches a predetermined maximum value, then requests are processed from the low priority I/O queue to prevent starvation of the low priority I/O requests in the event there is a stream of numerous high priority I/O requests (Paragraph 0020 of Johnson).

The Examiner notes further that when taken in combination with Christenson, the starvation counter of Johnson would serve to limit access to a particular region, ie the HIGH data, such that COLD data could be accessed. Such combination would have yielded predictable results to one of ordinary skill in the art at the time of invention thus obviating that which is instantly claimed.

Therefore, it would have been obvious to combine Johnson with Christenson for the benefit of the prevention of starvation to obtain the invention as specified in claims 14-19, 28, and 35-37.

As per dependent claim **15**, the combination of Christenson and Johnson teach, storing data to be metered within the storage device based on a priority level of the data (Column 7 lines 13-43 of Christenson).

As per dependent claim **16**, the combination of Christenson and Johnson teach, determining, for a selected data, whether the selected data will be stored within the first region or the second region (Column 9 line 57 to Column 10 line 13 of Christenson).

As per dependent claim **17**, the combination of Christenson and Johnson teach, defining a plurality of regions within the storage device; and assigning a metering threshold for selected regions of the plurality of regions (Column 10 lines 14-53 of Christenson).

As per dependent claim **18**, the combination of Christenson and Johnson teach, where the plurality of regions are defined by setting one or more addresses within the storage device (Column 9 lines 27-55 of Christenson: taught as the partitioning and the addresses resulting therefrom).

As per dependent claim **19**, the combination of Christenson and Johnson teach, monitoring a number of access requests to the second region; and initiating the metering when the number of access requests reaches a threshold (Paragraph 0020 and 0025 of Johnson).

As per independent claim **28**, the combination of Christenson and Johnson teach, processing access requests to a storage device; metering access requests to a first predefined region within the storage device to maintain response time for access requests to a second predefined region within the storage device; and setting a threshold value of access requests, where access requests to the first region are caused to be metered after the threshold value of access requests are processed (*The Examiner incorporates by reference herein the rejection made supra with respect to claim 14 and further notes that Christenson teach a computer readable medium as claimed at least as is shown in Claims 41 and 43*).

As per independent claim **35**, the combination of Christenson and Johnson teach, allocation logic configured to define a plurality of regions within the storage device based on information received from a user; (Column 12 lines 35-61 of Christenson) threshold logic configured to assign a metering threshold to one or more selected regions of the plurality of regions; and an access controller configured to process access requests to the storage device, the access controller including logic configured to meter access requests to a selected region of the plurality of regions once a metering threshold for the selected region is met (Paragraph 0020 and 0025 of Johnson).

As per dependent claim **36**, the combination of Christenson and Johnson teach, where the allocation logic is further configured to cause selected data to be placed within a selected region of the plurality of regions based on a frequency of access to the selected data (Column 6 lines 46-67 of Christenson).

As per dependent claim **37**, the combination of Christenson and Johnson teach, where the access controller includes means for metering access requests (Column 5 line 65 to Column 6 line 41 of Christenson: the means being taught as the system; and Column 6 lines 45-67: taught as the COLD REGION and the higher priority given to the HOT REGION and thus access requests to the COLD REGION are metered).

(10) Response to Argument

35 USC § 102(b) Rejection of Claims 1-5, 8-12, 25-27, 29-34, and 38 as being anticipated by Christenson et al

At page 10 of the Appeal Brief filed 18 August 2010 and continued through pages 11-12 under Appellant's heading I., Appellant argues in part:

> *"The controller of Christenson is not configured to allow metered access to one region and unmetered access to another region. Such a feature is not taught or suggested by Christenson. In the Final Office Action (Final OA), the examiner relies on col. 12, lines 15-32 of Christenson (Final OA, page 13) as allegedly teaching these features." … "The disclosed process fails to teach or suggest "unmetered access to data within a second predefined region within the storage device" as claimed."*

The Examiner respectfully disagrees. Appellant's main argument relies on the premise that the claim requires unmetered access to data in a first region of a hard drive, and metered access to data in a second region of a hard drive. The prior art made of record and relied upon, Christenson teaches this at least as is shown in Column 6 lines 45-67 as well as Column 12 lines 18-32, 62-67 and Column 13 lines 1-8. Christenson teaches HOT data and COLD data in specific regions, the specific regions being the areas in which the HOT data and COLD data are stored.

Christenson teaches that high priority jobs have access to HOT data before access to COLD data. Christenson further teaches that low priority jobs then have access to HOT data and then COLD data. Appellant argues that because low priority jobs requesting HOT data must wait for high priority jobs requesting COLD data that Christenson does not anticipate the claim language. However, as the claim simply requires that metered access be given to a predefined region and that unmetered access be given to a second predefined region, Christenson teaches this in view from the high priority jobs, as access to HOT data – and the region that the HOT data occupies - is given first over access to COLD data - and the region that the COLD data occupies..

The claimed language does not preclude this view as taken from the high priority jobs and thus the claim does not require that all access requests be considered.

Further the Examiner wishes to draw attention to Christenson in the instance where only high priority or low priority jobs are being serviced. In these situations, the jobs will have unmetered access to HOT data and the region that the HOT data occupies and metered access to COLD data and the rejoin that the COLD data occupies.

35 USC § 103 (a) Rejection of Claims 6-7 as being unpatentable over Christenson in view of Cousins

At page 16 of the Appeal Brief filed 18 August 2010 and continued through page 17 under Appellant's heading II., Appellant argues in part:

> *"First, the examiner has erred since, as explained under claim 1, Christenson fails to teach or suggest predefined regions within the storage device that are metered or not metered. Thus, Christenson cannot teach or suggest the claimed feature of defining such predefined regions by "one or more logical block addresses."*

The Examiner respectfully disagrees. Christenson Column 13 lines 33-59 states that the software provides the interface between the disk and the programs. As the software controls such interactions between the disk and programs, the first region and second region, as noted *supra* as the area in which the HOT and COLD data reside, are accessed through this software and not directly - logical addressing is used to access the disk to obtain the data requested by the programs. Thus, Christenson in combination with Cousins obviates that which is instantly claimed.

35 USC § 103 (a) Rejection of Claims 14-19, 28, and 35-37 as being unpatentable over Christenson in view of Johnson

At page 18 of the Appeal Brief filed 18 August 2010 and continued through page 19 under Appellant's heading III., Appellant argues in part:

> *"Johnson fails to cure the deficiencies of Christenson and their combination still fails to establish a prima facie obviousness rejection for independent claims 14, 28 and 35. Both references process jobs based on job priority. Thus combining them still only teaches processing jobs based on job priority, not disk regions. The claimed elements of "limiting a number of access requests to the second*

> *region based in part on a threshold number of the access requests to the second region" have not been found."*

The Examiner respectfully disagrees. The Examiner first incorporates by reference herein the comments made *supra* with respect to regions and the teachings of Christenson. Second, the Examiner notes that Johnson teach a starvation counter in paragraph 0020. When the starvation counter reaches a predetermined value [threshold as instantly claimed], low priority requests are serviced. This anticipates the instant claim language as high priority requests are limited based on the starvation counter.

The Examiner notes further that when taken in combination with Christenson, the starvation counter of Johnson would serve to limit access to a particular region, ie the HOT data, such that COLD data could be accessed. Such combination would have yielded predictable results to one of ordinary skill in the art at the time of invention thus obviating that which is instantly claimed.

At page 18 of the Appeal Brief, Appellant argues that the purpose of starvation prevention is not to limit or meter requests but instead to do the opposite. The Examiner notes that the language may not be identical, but the functionality of Johnson, servicing low priority requests when the predetermined value is reached serves to perform the same function as recited in the claims. The claims require that requests to access a second region are limited in part on a threshold number. With Johnson and high priority requests being limited, when taken in combination with Christenson as noted *supra*, the limitations as claimed are obvious over the combination of the two.

At page 20 of the Appeal Brief, Appellant argues that there is no discussion of assigning a metering threshold for selected regions. The Examiner again incorporates by reference herein the comments made *supra* with respect to Christenson and the discussion of 'region.' The combination of Johnson and Christenson as noted obviates the metering threshold through Johnson's predetermined value to selected regions as provided for in Christenson.

At page 20 of the Appeal Brief, Appellant argues that improper hindsight has been used in attempting to show that Christenson teaches or suggests the claims. The Examiner notes that Appellant's statements amount solely to conjecture as to what the reference may or may not have suggested without providing any evidence in support of such an assertion.

(11) Related Proceeding(s) Appendix

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Matthew Bradley/
Examiner, Art Unit 2187

Conferees:

/Kevin L Ellis/
Supervisory Patent Examiner, Art Unit 2187

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